

Humpback Chub
(Gila cypha)

**5-Year Review:
Summary and Evaluation**

**U.S. Fish and Wildlife Service
Mountain-Prairie Region
Lakewood, Colorado**

5-YEAR REVIEW

Humpback Chub (*Gila cypha*)

GENERAL INFORMATION

Methodology Used to Complete the Review:

In accordance with section 4(c) (2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened and endangered species to determine whether its status has changed since the time of its listing, or its last status review, and whether it should be classified differently or removed from the list of threatened and endangered species. The U.S. Fish and Wildlife Service (Service) evaluated the biology and status of the Humpback Chub as part of a Species Status Assessment (SSA) to inform this 5-year review and, if needed, recovery planning. A Service Writing Team, in coordination with the Science Advisory Subgroup of the Humpback Chub Recovery Team, developed the SSA report (USFWS 2017). The Science Advisory Subgroup is comprised of species experts from state and federal agencies, such as the States of Arizona and Utah, the United States Geological Survey, the National Park Service, and the Western Area Power Administration, who actively work with Humpback Chub across its occupied range.

The SSA report represents our evaluation of the best available scientific information, including the resource needs and the current and future condition of the species. We developed three future scenarios of environmental and management conditions to discuss the viability of the species in the future, which were then evaluated by the Science Advisory Subgroup. Independent peer reviewers and partner representatives reviewed the SSA report before we used it as the scientific basis to support our 5-year review decision-making process.

Region 6 is the lead region for this action in coordination with Regions 2 and 8. The lead field office (FO) is the Colorado River Recovery Program office.

Background:

Listing History

The following is a chronology of listing actions for the Humpback Chub:

- First included in the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 (32 FR 4001);
- Considered as “endangered” under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa);
- Received protection as “endangered” under Section 4(c)(3) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*); and
- Included in the list of endangered and threatened species published in the Federal Register on January 4, 1974 (39 FR 1175).

The following recovery plan and revisions have been developed for the Humpback Chub:

- Recovery Plan approved on August 22, 1979 (U.S. Fish and Wildlife Service 1979);
- Revised Recovery Plan approved on September 19, 1990 (U.S. Fish and Wildlife Service 1990);
- Revised Recovery Goals were approved August 1, 2002 (U.S. Fish and Wildlife Service 2002), but were withdrawn and declared of no force and effect by court order on January 18, 2006¹ for lack of recovery timelines and estimated costs;
 - The recovery goals were otherwise found to be scientifically sound and still serve as the Service's quantifiable and measurable recovery criteria;
- Revised recovery goals were drafted in 2008, but not finalized; and
- This 5-year review recommends development of a revised recovery plan.

REVIEW ANALYSIS

The SSA report (USFWS 2017, entire) summarizes the best available scientific information on the current status and likely future viability of the species. The SSA report provided the scientific basis for the 5-year review. The SSA report describes the current and future viability of the Humpback Chub in terms of the conservation biology principles of resiliency, redundancy, and representation. Resiliency describes the ability of individuals and populations to withstand environmental or demographic stochasticity. Redundancy describes the ability of populations to withstand catastrophic events in a way that spreads risk and minimizes potential loss of the species. Redundancy is characterized as having multiple, resilient populations distributed across the range of the species. Representation describes the ability of a species to adapt to changing environmental conditions over time and is characterized by the breadth of genetic and environmental diversity within and among populations (Smith *et al.* 2018, p. 7–8).

Current Species Condition

The Humpback Chub currently inhabits five, wild (not stocked) populations in the Colorado River basin, including four populations in the upper Colorado River basin² (hereafter, upper basin) at Black Rocks, Westwater Canyon, Desolation and Gray canyons, and Cataract Canyon, and one population in the lower basin in the Grand Canyon³ (hereafter, lower basin) (Figure 1). A sixth population in Dinosaur National Monument (DNM), which includes Yampa and Whirlpool canyons in the upper basin, is now considered functionally extirpated. The six populations occupy 598 kilometers (km) (372 miles [mi]) of river, or about 78 percent of the historical 764 km (475 mi).

¹ *Grand Canyon Trust et al., vs. Gale Norton et al.*, United States District Court for the District of Arizona, Order No. 04-CV-636-PHX-FJM

² Warm water river reaches upstream of Glen Canyon Dam and Lake Powell

³ The “Grand Canyon” includes the Colorado River and its tributaries from the Paria River to Lake Mead, importantly the Little Colorado River.

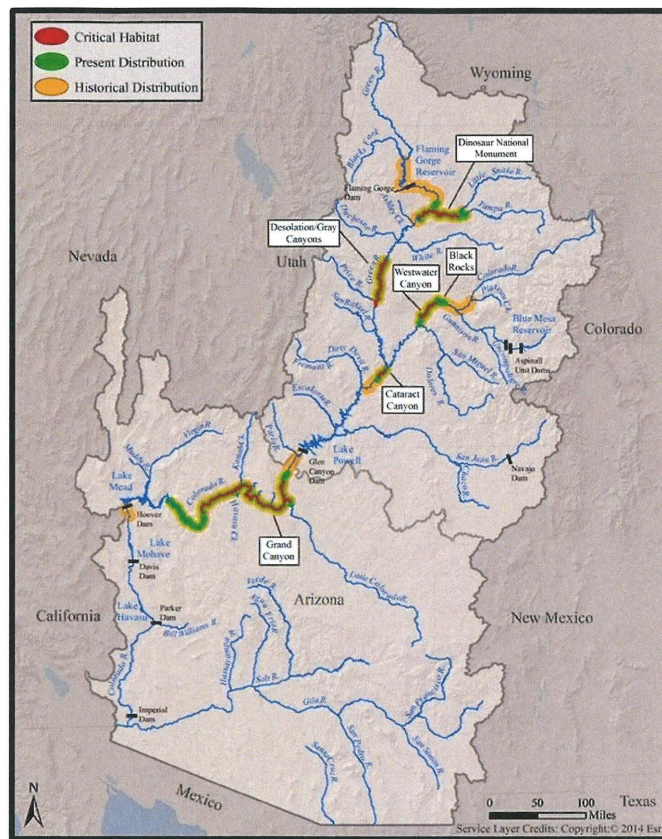


Figure 1. Historical and present distribution of Humpback Chub, including designated critical habitat.

Humpback Chub individuals, populations, and the species need the following resources:

1. Diverse rocky canyon river habitat for spawning, nursery, feeding, and shelter;
2. Suitable river flow and temperature regimes for spawning, egg incubation, larval development, and growth;
3. Adequate and reliable food supply, including aquatic and terrestrial insects, crustaceans, and plant material;
4. Habitat with few nonnative predators and competitors that allow the young to survive and recruit to maintain self-sustaining populations;
5. Suitable water quality with few contaminants and little risk of spills of petroleum products and other toxic materials;
6. Unimpeded range and connectivity that allow free movement and access to habitats necessary for all life stages;
7. Multiple persistent populations (resiliency), each with reproductive potential, recruitment, and adult survival, to ensure redundancy; and
8. High genetic diversity within and across populations to maintain and ensure adaptive traits (representation).

The lower basin population in the Grand Canyon and Little Colorado River is the largest, with a core population size of approximately 12,000 adults that has remained stable over the last 10 years (since 2008). In the past, a substantial population decline in the 1990s was followed by a strong population increase through the early 2000s leading to the current, decade-long period of stability. In addition to the core population, several hundred adults and juveniles are distributed throughout the mainstem of the Grand Canyon, and Humpback Chub are reproducing in the western Grand Canyon. Successful translocations in the Little Colorado River and Havasu Creek have further expanded the range of the species into new habitats in the lower basin.

Current resource conditions within the lower basin are mostly adequate based on the resource needs identified for the species (Table 1). Throughout the lower basin, Humpback Chub have high quality canyon habitat, unimpeded connectivity to mainstem habitats, and high genetic diversity. River flow, water temperature, food supply, predation, and competition are the key factors that limit the size and resiliency of the lower basin population. Habitat conditions in the lower basin are markedly different than those in the upper basin because cold water releases from the Glen Canyon Dam influence lower basin water temperature and food availability. The Long-Term Experimental and Management Plan Environmental Impact Statement (EIS) currently directs flow releases from Glen Canyon Dam to minimize impacts on canyon resources. In addition, nonnative fish control and Humpback Chub translocations help support the lower basin population.

Table 1. A summary of the current resource conditions needs for the six populations of the Humpback Chub. [For more detail descriptions of resource conditions, see Table 7 and sections 4.1 and 4.2. of the SSA report]. Color codes: dark green = resource condition is good, light green = fair; yellow = neutral, orange = poor; red = bad.

Resource (See numbering above)	Upper Basin					Lower Basin
	Black Rocks	Westwater Canyon	Desolation/ Gray canyons	Cataract Canyon	Dinosaur National Monument	Grand Canyon
	Extant				Extirpated	Extant
1. Habitat						
2a. River flow						
2b. Temperature						
3. Food						
4. Predators						
5. Water Quality						
6. Connectivity						
7. Redundancy						
8. Genetics						

In the upper basin, the four extant populations vary widely in the length of occupied habitat and densities of Humpback Chub, ranging from approximately 25 to 400 fish per stream mile. Both the Black Rocks and Westwater Canyon populations declined in the early 2000s, but have apparently stabilized over the past decade. The other two extant upper basin populations, Desolation and Gray canyons and Cataract Canyon, persist but the lack of available monitoring data are not sufficient to make claims of changes over time. The extirpation of the Dinosaur National Monument population appears to have been a gradual process; likely beginning when Green River flows and temperatures were altered from the construction of Flaming Gorge Dam in 1964.

Resource conditions within each of the four extant upper basin populations are mostly adequate based on the resource needs identified for the species (Table 1). The upper basin populations have high quality rocky canyon habitat, suitable temperature, adequate food base, unimpeded connectivity, and high genetic diversity. Adequate flow regimes and nearby populations of invasive predatory fish are the resources most limiting the resiliency of Humpback Chub in the upper basin. However, through stakeholder conservation actions, flow management and invasive predator control continues to improve Humpback Chub resource conditions.

Hybridization and introgression (sharing of genes between species) among three sympatric (geographically overlapping) mainstem native *Gila* species⁴ influences each of the four upper basin populations. Genetic experts report that hybridization among the native chubs was likely occurring prior to Anglo-American settlement of the West. Hybridization does not occur in the lower basin where the Humpback Chub's range does not overlap with the other native chubs. It is unclear if human alteration of habitat conditions enhances hybridization, or if hybridization reduces or replaces contemporary numbers of genetically distinct Humpback Chub. Therefore, the extent that hybridization influences the genetic diversity (representation) of the four upper basin populations is unknown.

Conservation programs responsible for monitoring Humpback Chub and managing threats exist in both the upper and lower basin. Since 1988, the Upper Colorado River Endangered Fish Recovery Program (UCREFRP) coordinates recovery of the Humpback Chub and other fish, including the Colorado Pikeminnow, Razorback Sucker, and Bonytail Chub in the upper basin. The UCREFRP is implemented via a Cooperative Agreement, which is in place until 2023. Since 1997, the Glen Canyon Dam Adaptive Management Program (GCDAMP) coordinates protection of natural resources of the Colorado River through the Grand Canyon, including the Humpback Chub and Razorback Sucker from Glen Canyon Dam to the Lake Mead inflow. These collaborative conservation programs have implemented a suite of actions that benefit the Humpback Chub and other native species.

⁴ Roundtail Chub (*Gila robusta*; not listed) and Bonytail Chub (*Gila elegans*; also listed as endangered) being the other two

Summary of Current Condition

In the SSA report, we determined that the Humpback Chub has many traits that enable individuals to be resilient in the face of environmental or demographic stochasticity, including a long life span, high reproductive potential, use of habitats and turbidity that are arduous to other species, adaptation to a wide variety of flow and thermal regimes, and a variable omnivorous diet. Population resiliency is demonstrated via a variety of traits including the persistence of small populations (Cataract Canyon), population increases after previous declines (Grand Canyon), population establishment after translocations (Havasu Creek), and potential stabilization after previous declines (Black Rocks and Westwater Canyon). In addition, the current population size of the Grand Canyon population protects it from a variety of threats.

The current distribution and number of populations of the Humpback Chub provides a sufficient level of redundancy, albeit at a low level. Existing populations have independent susceptibility to threats and stochasticity by occurring in different river basins. New populations are being discovered (western Grand Canyon) or established (Havasu Creek) in the lower basin, increasing lower basin redundancy. This redundancy also assists with representation, as all genetic diversity of the species occurs in multiple populations, except the very large Grand Canyon population. In the upper basin, exchange of individuals is sufficient to ensure genetic diversity.

Future Species Condition

The SSA report evaluates the future condition of the species 16 years into the future, a biologically meaningful timeframe that is approximately two Humpback Chub generation times in the upper basin⁵. In order to incorporate uncertainty about predictions of future conditions, the SSA report describes three plausible future scenarios. These three scenarios capture the full range of risk for the species 16 years into the future. The SSA report then evaluated the resulting condition of the resource needs under each scenario. We also evaluated an additional, 40-year timeframe for each of the three scenarios in Appendix C of the SSA report.

As summarized above under Current Species Condition, stream flow and predation/competition from nonnative predatory fish are key factors that influence the four upper basin populations. Stream flow, water temperature, food supply, and predation/competition from nonnative fish are key factors that influence the lower basin population. Potential future scenarios focus on management commitment, those resources that most influence the current condition, and new or emerging stressors that could plausibly influence the species in the future. Because there is no indication that the threats of stream flow and non-native predatory fish will decline without ongoing management intervention, all the future scenarios assume that the risk from non-native fish will increase and that the availability of water will decrease over the next 16 years. The three

⁵ 16 years is slightly less than two generations in the lower basin, due to higher adult survival rates.

future scenarios include varying levels of management actions that mitigate the risk from changing conditions, including varying levels of implementation and effectiveness of management.

The three future scenarios described and evaluated in detail in the SSA report are:

- Scenario 1 [Environmental Stressors Increase and New or Discretionary Extralegal Actions are Eliminated]- This scenario includes elimination of some active and adaptive actions, and a reduction in voluntary management actions for the species, such that many stakeholder actions are no longer in place to mitigate future conditions including decreased water availability, future water development, or nonnative fish. Under this scenario, conditions in both the upper and lower basin are expected to strain the resiliency of Humpback Chub with poor resources conditions. The upper basin will likely see dramatic population declines, will likely lose another population to extirpation, and cannot re-establish the Dinosaur National Monument population. A long-standing collaborative commitment to the recovery of Humpback Chub in the upper basin has existed for 30 years (via the UCREFRP); however program partners are currently in the process of defining management actions and associated costs post-2023 (when the existing Cooperative Agreement expires).
- Scenario 2 [Legally Mandated Management Actions and Additional Adaptive Management Actions Continue, but are Not Completely Effective] - In addition to minimum actions required under Scenario 1, this scenario provides additional proactive and adaptive stakeholder management practices into the future; however these actions are unable to mitigate impacts of drought, future water development, nonnative fishes, or other threats. Under this scenario in the upper basin, the increased threat of reduced water availability and existing nonnative fish populations are mitigated with additional actions but those actions are not completely effective. Rocky canyon habitat, suitable temperature, adequate food supply, and connectivity of populations are largely still provided, and catastrophic low flows are prevented. Under this scenario in the lower basin, the core Little Colorado River population continues to recruit, but areas outside may be reduced.
- Scenario 3 [Legally Mandated Management Actions and Adaptive Management Actions Continue, and Are Effective] - In addition to minimum actions required under Scenario 1, this scenario provides additional proactive and adaptive stakeholder agencies' management practices into the future for the species, and these actions are sufficient to mitigate impacts of drought, future water development, nonnative fishes, or other threats. Upper basin populations slowly stabilize or increase in abundance with improved recruitment. Recent declines in upper basin populations are likely deemed within natural variability. The genetic diversity of the upper basin is maintained. In the lower basin, the physical habitat will remain intact and flow regimes are already in place. Temperature,

food supply, and nonnative fish conditions could improve for Humpback Chub with implementation of new actions.

Considering individual and population traits, the current condition of the resource needs, and the potential future condition of those resource needs, the SSA report projected the future viability of the species in terms of resiliency, redundancy, and representation 16 years into the future under the three potential future scenarios. It is important to point out that the unresolved future of the collaborative partnership in the upper basin (the UCREFRP) in scenario 1 results in many of the predictions for degraded resource conditions; whereas a continued commitment to the partnership in scenarios 2 and 3 maintain more adequate resource conditions. In the upper basin, scenario 1, management decreases and stressors increase, resulting in bad conditions for Humpback Chub (Table 2). Scenario 2 provides poor to neutral conditions (Table 2) in the upper basin. Scenario 3, where management actions continue and are effective, is expected to result in fair conditions that support upper basin populations (Table 2). For the lower basin population, scenario 1 negatively impacts resiliency and could diminish redundancy, but all other conditions in the lower basin are fair to good in all three scenarios (Table 2). This analysis of future scenarios demonstrates that the future resiliency, redundancy, and representation of the four extant upper basin populations are much more tenuous 16 years into the future and are dependent on management commitment and effectiveness.

Table 2. A summary of resiliency, redundancy and representation under the three future scenarios presented above for the upper and lower basins. (For more detail descriptions see Tables 19 and 20 and section 6.2 of the SSA report.) Color codes: dark green = good, light green = fair; yellow = neutral, orange = poor; red = bad.

		Resiliency	Redundancy	Representation
Upper Basin	S1	Red	Red	Red
	S2	Yellow	Orange	Yellow
	S3	Light Green	Light Green	Light Green
Lower Basin	S1	Orange	Yellow	Light Green
	S2	Light Green	Light Green	Light Green
	S3	Dark Green	Dark Green	Dark Green

As described in Appendix C of the SSA report, we conducted additional analysis to extend the future scenario analysis out to 40 years (Figure 2). This effort used the viability metrics at 0 years (current condition) and at 16 years for all three scenarios (future conditions) and then extrapolated⁶ the relationship between those evaluations out to 40 years. That is, the trends in Figure 2 explicitly use the previous analysis in the SSA report to support conclusions about conditions at 40 years. While this is a qualitative evaluation, it importantly communicates a

⁶ The trend lines were extrapolated linearly for scenarios 2 and 3 and asymptotically for scenario 1.

longer timeframe than previously considered in the SSA report. Figure 2 also includes uncertainty about each future viability projection using a shaded area of the projection color.

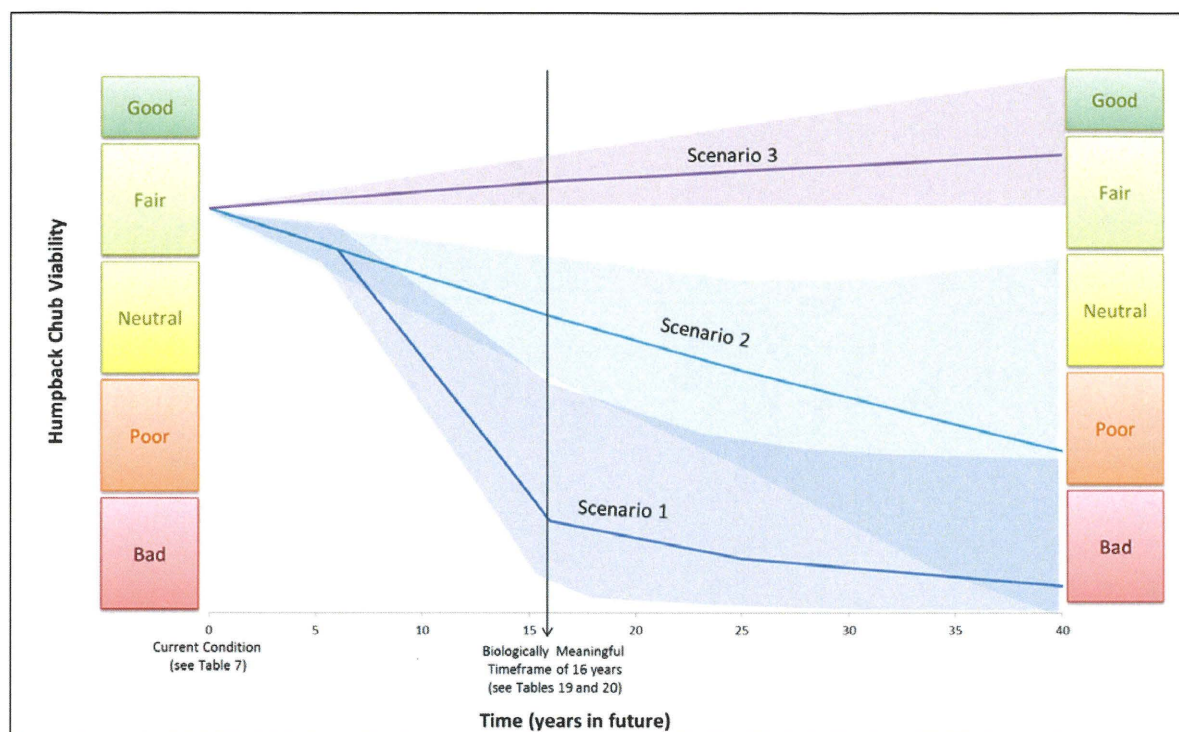


Figure 2. Humpback Chub viability projections forty years into the future. Data points at zero and 16 years are based on Tables 7, and 19 and 20 of the SSA report, respectively. Shaded area represents possible ranges of outcomes, communicating uncertainty of projections.

Summary of Future Condition

Under scenario 1, conditions would severely degrade within both 16 and 40 years, primarily because of the unresolved future of the collaborative partnership in the upper basin (the UCREFRP). However, if collaborative partnerships remain in place and their conservation actions are effective as described under scenario 3, resource conditions improve at 16 and 40-year timeframes. Under scenario 2, degradation of resources takes place, even as conservation actions continue, resulting in neutral conditions within 16 years, but poor conditions within 40 years. Although there is large uncertainty of resource conditions under scenario 2 at 40 years, extrapolation of the conditions demonstrates a continuing decline in resource conditions. The potential extirpation of multiple populations could most likely occur in the upper basin under the short 16-year timeframe in scenario 1 and the longer 40-year timeframe under scenario 2. Under scenario 3, ongoing threat management proves successful in the long term, resulting in some improvement in resource conditions. The current health (resiliency) and distribution

(redundancy) of all four populations (redundancy), reduces the risk from a potential catastrophic event under scenario 3.

Based on the uncertain trajectory of several of the upper basin populations, the uncertainty associated with certain resource conditions (e.g. distribution and abundance of invasive predatory species, future flow conditions, and food availability in the Grand Canyon), and the unresolved future of the collaborative partnership in the upper basin (the UCREFRP), species conditions and viability could be severely degraded within 16 to 40 years depending upon which scenario occurs.

Synthesis (Application of SSA Results to ESA Classification)

Under the Act, an endangered species is defined as any species that is “in danger of extinction throughout all or a significant portion of its range.” Based on the current condition of the Humpback Chub described in the SSA report and summarized above in terms of resiliency, redundancy, and representation, we conclude that the current risk of extinction is low, such that the species is not in danger of extinction throughout all of its range. Current resource conditions in both the upper and lower basin are fair to good, and are mostly adequate to support the species (Table 1). These resource conditions support a large, stable population in the lower basin and multiple extant populations in the upper basin.

The species currently demonstrates sufficient individual and population resiliency, redundancy, and representation across both the upper basin and lower basin populations, such that the potential extirpation of multiple populations is not likely to occur now and in the short-term. The current resiliency of the large core population in the lower basin and the current resiliency of the four populations in the upper basin decrease the risk to the species from stochastic and catastrophic events, such that the species currently has a low risk of extinction. Therefore, we conclude that the Humpback chub does not meet the definition of an endangered species.

Having determined that the Humpback Chub is not an endangered species, we next compared the status of the species to the definition of a threatened species under the Act. As defined by the Act, a threatened species is any species which is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The foreseeable future refers to the extent to which the Secretary of the Department of Interior can reasonably rely on predictions about the future in making determinations about the future conservation status of the species (U.S. Department of Interior, Solicitor’s Memorandum, M-37021, and January 16, 2009). The key statutory difference between a threatened species and an endangered species is the timing of when a species may be in danger of extinction, either now (endangered species) or in the foreseeable future (threatened species).

Under two scenarios (1 and 2), the species is not adequately resilient, redundant, or represented within 16 years, while it is under the remaining scenario (3). Viability declines more rapidly under scenario 1 than scenario 2, due to the lack of ongoing conservation efforts in scenario 1

(Figure 2). In 40 years under scenario 2, viability further decreases, albeit with high uncertainty. Conversely, there is strong support that under scenario 3 the species is viable, and will remain so under multiple timeframes.

Because the projected viability of the species declines substantially under scenario 1 within 16 years and under scenario 2 within 40 years, the Humpback Chub could become an endangered species within the foreseeable future throughout all of its range. Even with the high viability of the species under scenario 3, there is enough risk to the species under scenarios 1 and 2 in 16 and 40 years into the future that we conclude that this species meets the definition of a “threatened” species.

Recovery Criteria

Measurable and Objective Demographic Criteria from the 2002 Humpback Chub Recovery Goals (Service 2002) are evaluated here:

Recovery Goal for Downlisting (over a 5 year period):	Current Condition	Summary
1) two genetically and demographically viable, self-sustaining core populations are maintained, such that each point estimate for each core population exceeds 2,100 adults	<ul style="list-style-type: none"> The core population in the lower basin has never dropped below 5,000 adults since monitoring began in 1989. The upper basin core (Westwater / Black Rocks) population currently exceeds 2,100 adults but has been below this threshold as recently as 2012. 	<ul style="list-style-type: none"> The lower basin core population meets this criterion. The 2nd core population (in the upper basin) has not fully met this criterion.
2) the trend in adult (age 4+; >200 mm TL) point estimates for each of the six extant populations does not decline significantly	<ul style="list-style-type: none"> The lower basin population has demonstrated positive or stable intrinsic growth since 2001. Four of the upper basin populations have not declined significantly based on the five most recent estimates. The fifth upper basin population (Dinosaur National Monument) was considered functionally extirpated soon after the recovery goals were drafted. 	<ul style="list-style-type: none"> This criterion has been met relative to the five most recent population estimates. However, all populations have demonstrated periods of significant decline throughout their period of record. This criterion should be reevaluated based on new information on population dynamics.
3) mean estimated recruitment of age-3 (150–199 mm TL) naturally produced fish equals or exceeds mean annual adult mortality for each of the six extant populations	<ul style="list-style-type: none"> Estimates of recruitment are only available from the lower basin population (the largest population) where this criterion has been met since 2001. In the upper basin, we assume (based on adult trends) recruitment has exceeded adult mortality in 3 of 4 extant populations (exception Deso/Gray) since 2011. 	<ul style="list-style-type: none"> Criteria mostly met. This criterion should be reevaluated based on new information on population dynamics and with recognition that direct measurement of recruitment is very difficult in the upper basin.

RESULTS

Recommended Classification: After assessing the best available information, we conclude that the Humpback Chub is not in danger of extinction throughout all of its range, but is likely to become so in the foreseeable future; that is, it is a threatened species throughout all of its range. We recommend downlisting the Humpback Chub to threatened status.

☒ **Downlist to Threatened**
☐ **Uplift to Endangered**
☐ **Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):
 ☐ *Extinction*
 ☐ *Recovery*
 ☐ *Original data for classification in error*
☐ **No change is needed**

New Recovery Priority Number: Current Priority is 2C; no change recommended.

Brief Rationale:

Listing and Reclassification Priority Number, if reclassification is recommended

Reclassification (from Threatened to Endangered) Priority Number: ____
Reclassification (from Endangered to Threatened) Priority Number: 2C
Delisting (Removal from list regardless of current classification) Priority Number:

Brief Rationale:

RECOMMENDATIONS FOR FUTURE ACTIONS – Proceed with a proposed rule to downlist the Humpback Chub and revise the recovery plan.

REFERENCES –

- David Smith, Nathan L Allan, Conor P McGowan, Jennifer Szymanski, Susan R Oetker, and Heather M Bell. 2018. Development of a Species Status Assessment Process for Decisions under the U.S. Endangered Species Act. *Journal of Fish and Wildlife Management* In-Press. <https://doi.org/10.3996/052017-JFWM-041>
- U.S. Fish and Wildlife Service. 2002. Humpback chub (*Gila cypha*) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO.

U.S. Fish and Wildlife Service. 2017. Species status assessment for the Humpback Chub (*Gila cypha*). U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, CO. 236 pages.

**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW
Humpback Chub (*Gila cypha*)**

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

- ☒ Downlist to Threatened
- ☐ Uplist to Endangered
- ☐ Delist
- ☐ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 2C

Review Conducted By:

REGIONAL OFFICE APPROVAL:

The Regional Director or the Assistant Regional Director, if authority has been delegated to the Assistant Regional Director, must sign all 5-year reviews.

Lead Regional Director, U.S. Fish and Wildlife Service

Approve

Nathan E. Walsh

Date

3/19/2018

The Lead Region must ensure that other regions within the range of the species have been provided adequate opportunity to review and comment prior to the review's completion. Written concurrence from other regions is required.